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Blakely Sokoloff Taylor & Zafman
12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025

EXAMINER

ROBERTS, JESSICA M

ART UNIT	PAPER NUMBER
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2621

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/500,352

Applicant(s)

CHOI ET AL.

Examiner

JESSICA ROBERTS

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06/22/2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/02)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of Claims

Claims 1-26 are currently pending in Application No. 10/500,352. Claims 1, 15, 23, 24, and 26 have been amended.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/22/2009 has been entered.

Response to Arguments

Applicant's arguments filed 06/22/2009 have been fully considered but they are not persuasive.

2. As to Applicants argument regarding the Examiner has not cited and the Applicants have been unable to locate any sections of Lipton or Oshima which cure the deficiencies of Nelson for amended claim 1.
3. The Examiner respectfully disagrees. Lipton discloses where the invention is a method and apparatus for multiplexing and demultiplexing two channels of picture information within a standard video channel. The method is specifically designed for field sequential stereoscopic display column 5 line 40-44 and fig. 1C. Further, disclosed

by Lipton is fig. 6A-6B where disclosed is a diagram representing a stereoscopic video signal format compatible with the NTSC protocol, with a 4-fold interlace with 262.25 lines/field, and a rate of 120 fields/second. Therefore, it is clear to the Examiner that Lipton discloses the left and right even and odd fields for stereoscopic display corresponds to a video to be displayed and to multiplex the right and left fields of the video, which reads upon the claimed limitation.

4. As to Applicants argument regarding the combination of Nelson, Lipton and Nelson fails to teach or suggest each element of amended claim 1. The Examiner respectfully disagrees.

5. Regarding claim 1, Nelson teaches A stereoscopic video encoding apparatus that supports multi- display modes based on a-user display information, comprising an encoding means for right and left-eye images by encoding the fields separated in the field separating means by performing motion and disparity compensation (fig. 12), and a multiplexing means for multiplexing encoded streams for only the-essential fields among the encoded streams received from the encoding means, based on the user display information ([0044]); wherein the encoding means determines a field of sub-layer of right and left eye images based on disparity estimation of a main layer of the right and left-eye images and motion estimation of an enhancement layer of the main layer (Nelson discloses where to implement this type of bi-directional motion/disparity compensated coding, an enhancement encoding block 402 includes a disparity estimator 406 and a disparity compensator 408 to estimate and compensate for the disparity between the left and right views having the same field order for disparity based

prediction. The disparity estimator 406 and the disparity compensator 408 preferably receive I-pictures and/or other reference images from the base stream encoder 410 for such prediction. The enhancement encoding block 402 preferably also includes an enhancement stream encoder 404 for receiving the right view video stream to perform motion based prediction and for encoding the right video stream to the enhancement stream using both the disparity based prediction and motion based prediction, [0134] and fig. 12. Therefore, it is clear to the Examiner that Nelson discloses that both the left and right video stream are encoded with the motion compensated DCT encoder as well as input into the disparity estimator, which reads upon the claimed limitation). Nelson is silent in regards to a field separating means for separating right and left-eye input images into an odd field of the left-eye image (LO), even field of the left-eye image (LE), odd field of the right-eye image (RO), and even field of the right-eye image (RE); the four streams corresponding to a video to be output on a display of a user; and a second sub-layer with the fields separated in the field separating means, and such that only the essential fields necessary to display the video on the display of the user are multiplexed for transmittal to the display of the user.

6. However, Lipton discloses a stereoscopic video signal format compatible with the NTSC protocol, with a 4-fold interlace with 262.25 lines/field, and rate of 120 fields per second (fig. 6A-6B). Lipton further discloses a controller is used to unsqueeze and demultiplex the signal before it is displayed on a monitor, the controller can organize the signal to produce a sequence of fields suitable for the display of a stereoscopic video image (column 10 line 7-21); the four streams corresponding to a video to be output on

a display of a user)(Lipton discloses where the invention is a method and apparatus for multiplexing and demultiplexing two channels of picture information within a standard video channel. The method is specifically designed for field sequential stereoscopic display column 5 line 40-44 and fig. 1C. Further, disclosed by Lipton is fig. 6A-6B where disclosed is a diagram representing a stereoscopic video signal format compatible with the NTSC protocol, with a 4-fold interlace with 262.25 lines/field, and a rate of 120 fields/second. Therefore, it is clear to the Examiner that Lipton discloses the left and right even and odd fields for stereoscopic display corresponds to a video to be displayed) such that only the essential fields necessary to display the video on the display of the user are multiplexed for transmittal to the display of the user (Lipton discloses where the invention is a method and apparatus for multiplexing and demultiplexing two channels of picture information within a standard video channel. The method is specifically designed for field sequential stereoscopic display column 5 line 40-44 and fig. 1C. Further, disclosed by Lipton is fig. 6A-6B where disclosed is a diagram representing a stereoscopic video signal format compatible with the NTSC protocol, with a 4-fold interlace with 262.25 lines/field, and a rate of 120 fields/second. Therefore, it is clear to the Examiner that Lipton discloses to multiplex the right and left even and odd fields of the video, which reads upon the claimed limitation)

7. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Nelson with Lipton's teaches of four fold interlace signal for providing a stereoscopic signal that can be processed to

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produce flicker less, field-sequential electronic stereoscopic display with good image quality, (column 10 line 10-19).

8. Nelson (modified by Lipton) does not explicitly disclose to generating four streams for right and left eye images.

9. However Oshima teaches where a right-eye signal 97 and a left-eye signal 98 are entered in a recording device 99. Being of interlace signals, in every 1/60, odd field signals 72a, 72b and even field signals 73a, 73b are entered. The signals are combined in combining units 101a, 101b, and transformed into frame signals 102a, 102b, in every 1/30 second. Compressed signals 83a, 83b compressed in compressing units 103a, 103b, column 12 line 35-42 and fig. 23. Since Oshima teaches the right and left eye signals are interleaved into even and odd fields and are compressed with compressing units, 103a, and 103b, it is clear to the examiner that Oshima teaches to generate even and odd fields of the video signal for the right and left eye and respectively encodes the video signals, which reads upon the claimed limitation.

10. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Oshima with Nelson (modified by Lipton) for providing a more cost effective signal processing of stereoscopic signals.

11. As to Applicants argument regarding the combination of Nelson, Lipton, and Oshima fails to disclose these elements of amended claims 15 and 23-26.

12. The Examiner respectfully disagrees. The Examiner directs to the Applicant to Oshima. Oshima teaches where a right-eye signal 97 and a left-eye signal 98 are entered in a recording device 99. Being of interlace signals, in every 1/60, odd field

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signals 72a, 72b and even field signals 73a, 73b are entered. The signals are combined in combining units 101a, 101b, and transformed into frame signals 102a, 102b, in every 1/30 second. Compressed signals 83a, 83b compressed in compressing units 103a, 103b, column 12 line 35-42 and fig. 23. Since Oshima teaches the right and left eye signals are interleaved into even and odd fields and are compressed with compressing units, 103a, and 103b, it is clear to the examiner that Oshima teaches to the bit stream is contains the right and left even and odd fields.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

15. Claims 1- 5, 11-14, 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al., US-2002/0009137 and in view of Lipton et al., US-5, 416, 510 and in further view of Oshima et al., US-6,574,423.

16. Regarding claim 1, Nelson teaches A stereoscopic video encoding apparatus that supports multi- display modes based on a-user display information, comprising an encoding means for right and left-eye images by encoding the fields separated in the field separating means by performing motion and disparity compensation (fig. 12), and a multiplexing means for multiplexing encoded streams for only the-essential fields among the encoded streams received from the encoding means, based on the user display information ([0044]); wherein the encoding means determines a field of sub-layer of right and left eye images based on disparity estimation of a main layer of the right and left-eye images and motion estimation of an enhancement layer of the main layer (Nelson discloses where to implement this type of bi-directional motion/disparity compensated coding, an enhancement encoding block 402 includes a disparity estimator 406 and a disparity compensator 408 to estimate and compensate for the disparity between the left and right views having the same field order for disparity based prediction. The disparity estimator 406 and the disparity compensator 408 preferably receive I-pictures and/or other reference images from the base stream encoder 410 for such prediction. The enhancement encoding block 402 preferably also includes an enhancement stream encoder 404 for receiving the right view video stream to perform motion based prediction and for encoding the right video stream to the enhancement stream using both the disparity based prediction and motion based prediction, [0134] and fig. 12. Therefore, it is clear to the Examiner that Nelson discloses that both the left and right video stream are encoded with the motion compensated DCT encoder as well as input into the disparity estimator, which reads upon the claimed limitation). Nelson is

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silent in regards to a field separating means for separating right and left-eye input images into an odd field of the left-eye image (LO), even field of the left-eye image (LE), odd field of the right-eye image (RO), and even field of the right-eye image (RE); the four streams corresponding to a video to be output on a display of a user; and a second sub-layer with the fields separated in the field separating means, and such that only the essential fields necessary to display the video on the display of the user are multiplexed for transmittal to the display of the user.

17. However, Lipton discloses a stereoscopic video signal format compatible with the NTSC protocol, with a 4-fold interlace with 262.25 lines/field, and rate of 120 fields per second (fig. 6A-6B). Lipton further discloses a controller is used to unsqueeze and demultiplex the signal before it is displayed on a monitor, the controller can organize the signal to produce a sequence of fields suitable for the display of a stereoscopic video image (column 10 line 7-21); the four streams corresponding to a video to be output on a display of a user (Lipton discloses where the invention is a method and apparatus for multiplexing and demultiplexing two channels of picture information within a standard video channel. The method is specifically designed for field sequential stereoscopic display column 5 line 40-44 and fig. 1C. Further, disclosed by Lipton is fig. 6A-6B where disclosed is a diagram representing a stereoscopic video signal format compatible with the NTSC protocol, with a 4-fold interlace with 262.25 lines/field, and a rate of 120 fields/second. Therefore, it is clear to the Examiner that Lipton discloses the left and right even and odd fields for stereoscopic display corresponds to a video to be displayed) such that only the essential fields necessary to display the video on the

display of the user are multiplexed for transmittal to the display of the user (Lipton discloses where the invention is a method and apparatus for multiplexing and demultiplexing two channels of picture information within a standard video channel. The method is specifically designed for field sequential stereoscopic display column 5 line 40-44 and fig. 1C. Further, disclosed by Lipton is fig. 6A-6B where disclosed is a diagram representing a stereoscopic video signal format compatible with the NTSC protocol, with a 4-fold interlace with 262.25 lines/field, and a rate of 120 fields/second. Therefore, it is clear to the Examiner that Lipton discloses to multiplex the right and left even and odd fields of the video, which reads upon the claimed limitation)

18. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Nelson with Lipton's teaches of four fold interlace signal for providing a stereoscopic signal that can be processed to produce flicker less, field-sequential electronic stereoscopic display with good image quality, (column 10 line 10-19).

19. Nelson (modified by Lipton) does not explicitly disclose to generating four streams for right and left eye images.

20. However Oshima teaches where a right-eye signal 97 and a left-eye signal 98 are entered in a recording device 99. Being of interlace signals, in every 1/60, odd field signals 72a, 72b and even field signals 73a, 73b are entered. The signals are combined in combining units 101a, 101b, and transformed into frame signals 102a, 102b, in every 1/30 second. Compressed signals 83a, 83b compressed in compressing units 103a, 103b, column 12 line 35-42 and fig. 23. Since Oshima teaches the right and

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left eye signals are interleaved into even and odd fields and are compressed with compressing units, 103a, and 103b, it is clear to the examiner that Oshima teaches to generate even and odd fields of the video signal for the right and left eye and respectively encodes the video signals, which reads upon the claimed limitation.

21. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Oshima with Nelson (modified by Lipton) for providing a more cost effective signal processing of stereoscopic signals.

22. Regarding **claim 2**, Nelson (modified by Lipton and Oshima) as a whole teaches everything as claimed above, see claim 1. Nelson is silent in regards to The stereoscopic video encoding apparatus as recited in claim 1, wherein the encoding means forms a main layer with the odd field of the left-eye image (LO) and the even field of the right-eye image (RE), a first sub-layer with the even field of the left-eye image (LE), and a second sub-layer with the odd field of the right-eye image (RO).

23. However, Lipton discloses the real time display field sequence and record output field sequence (fig. 24) which has 3 layers formed from the right even and left odd, right odd and left even, and right even and left odd, which exemplifies Lipton creating layers from different combinations of fields for the left and right eye.

24. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Nelson with Liptons' teaching of four fold interlace signal for providing a stereoscopic signal that can be processed to produce flickerless, field-sequential electronic stereoscopic display with good image quality (column 1 line 10-19).

25. Regarding **claim 3**, Nelson (modified by Lipton and Oshima) as a whole teaches everything as claimed above, see claim 1. In addition Nelson teaches The stereoscopic video encoding apparatus as recited in claim 2, wherein the encoding means ([0124] and fig.9) forms a base layer of the main layer with the odd field of the left-eye image (LO) and forms an enhancement layer of the main layer with the even field of the right-eye image (RE) (Nelson discloses the base stream may include information from left view images while the enhancement stream may include information from the right view images [0042], [0125], and fig. 9).The examiner notes that a left and right view would include the even and odd fields of the images) left and then performs encoding using estimation for motion and disparity compensation (Nelson, [0134] and fig. 12).

26. Regarding **claim 4**, Nelson (modified by Lipton and Oshima) as a whole teaches everything as claimed above, see claim 3. In addition, Nelson teaches the stereoscopic video encoding apparatus as recited in claim 3, wherein the first sub-layer performs the estimation for motion compensation based on the information related to the base layer, and performs the estimation for disparity compensation based on the information related to the enhancement layer ([0134] and fig. 12).

27. Regarding **claim 5**, Nelson (modified by Lipton and Oshima) as a whole teaches everything as claimed above, see claim 3. In addition, Nelson teaches the stereoscopic video encoding apparatus as recited in claim 3, wherein the second sub-layer performs the estimation for disparity compensation based on the information related to the base layer and the first sub-layer, and performs the estimation for motion compensation based on the information related to the enhancement layer. Nelson discloses the

enhancement encoding block 402 preferably also includes an enhancement stream encoder 404 for receiving the right view video stream to perform motion based prediction and for encoding the right video stream to the enhancement stream using both the disparity based prediction and motion based prediction ([0134]). Although Nelson is silent in regards to a second sub-layer, Lipton discloses where the record output field sequence contains more than one sub-layer (fig. 24).

28. The combination of Nelson and Lipton as a whole teaches the sub-layer performs estimation for disparity based on information related to the base layer and a sub-layer, and motion compensation from information relating to the enhancement layer.

29. Regarding **claim 11**, Nelson (modified by Lipton and Oshima) as a whole teaches everything as claimed above, see claim 1. In addition, Nelson teaches The stereoscopic video encoding apparatus as recited in claim 1, wherein the user display information includes a three-dimensional field shuttering display, a three-dimensional frame shuttering display, and a two-dimensional display ([0060], [0098], fig. 2 element 112 and fig. 6. Nelson further discloses the broadcasting system may also support production of non-standard video streams for two-dimensional (2D) or 3D application ([0030]).

30. Regarding **claim 12**, Nelson (modified by Lipton and Oshima) as a whole teaches everything as claimed above, see claim 1. In addition, Nelson teaches the stereoscopic video encoding apparatus as recited in claim 1, wherein the multiplexing means multiplexes the odd field of the left-eye image (LO) and the even field of the right-eye image (RE), in case where the user display information indicates a three-

dimensional field shuttering display ([0060]). Nelson further teaches alternate left and right video fields preferably are presented to the viewer by means of actively shuttered glasses, which are synchronized with the alternate interlaced fields (or alternate frames) produced by standard televisions ([0030]).

31. Regarding **claim 13**, Nelson (modified by Lipton and Oshima) as a whole teaches everything as claimed above, see claim 1. Nelson is silent in regards to the stereoscopic video encoding apparatus as recited in claim 1, wherein the multiplexing means multiplexes the odd field of the left-eye image (LO), the even field of the left-eye image (LE), the odd field of the right-eye image (RO), and the even field of the right-eye image (RE), in case where the user display information indicates a three-dimensional frame shuttering display.

32. However Lipton discloses representing a stereoscopic video signal format compatible with the NTSC protocol, with a 4-fold interlace with 262.25 lines/field, and a rate of 120 fields/sec (fig. 6A). Further, Lipton discloses the present invention is independent of the particular selection technique employed, and will work with any properly engineered individual shuttering device, column 12 line 4-23, which reads upon the claimed invention.

33. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Nelson with Liptons' teaching of four fold interlace signal for providing a stereoscopic signal that can be processed to produce flickerless, field-sequential electronic stereoscopic display with good image quality (column 1 line 10-19). The combination of Nelson and Lipton are silent in regards

to explicitly teaching the multiplexing means multiplexes the odd field of the left-eye image (LO), the even field of the left-eye image (LE), the odd field of the right-eye image (RO), and the even field of the right-eye image (RE). However, Oshima teaches multiplexing the left field (even and odd) and the right field (even and odd), fig. 23).

34. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Oshimas' teachings of multiplexing the left even and odd field and the right even and odd fields with Nelson (modified by Lipton) for providing a more cost effective signal processing of stereoscopic signals.

35. Regarding **claim 14**, Nelson (modified by Lipton and Oshima) as a whole teaches everything as claimed above, see claim 1. In addition, Nelson teaches The stereoscopic video encoding apparatus as recited in claim 1, wherein the multiplexing means multiplexes the odd field of the left-eye image (LO), and even field of the left-eye image (LE), in case where the user display information indicates a two-dimensional display ([0030] therefore, it is clear to the examiner that only the field of one eye (left or right) would need to be multiplexed, since the image or picture is flat or lacking depth).

36. Regarding **claim 23**, which recite a corresponding method to the encoding apparatus of claims 1-14. Thus the rejection and analysis made in claims 1-14 also apply here because the apparatus would have necessarily performed the method steps in claim 23.

37. Regarding **claim 25**, the analysis and rejection made in claims 1-14 also apply here. Nelson (modified by Lipton and Oshima) as a whole teaches a microprocessor

based system. Hence a computer processor for executing the necessary steps corresponding to the apparatus of claims 1-14 would have been inherent.

38. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al., US-2002/0009137 and in view of Lipton et al., US-.5, 416, 510 and Oshima et al., US-6,574,423 and further view of Wu et al., US-6,614, 936.

39. Regarding **claim 6**, Nelson (modified by Lipton and Oshima) as a whole teaches everything as claimed above, see claim 1. In addition, Nelson teaches The stereoscopic video encoding apparatus as recited in claim 1, wherein the encoding means forms a main layer with the odd field of the left-eye image (LO), a first sub-layer with the even field of the right-eye image (RE) ([0042] and [0125]). Nelson is silent in regards to a second sub-layer with the even field of the left-eye image (LE), and a third sub-layer with the odd field of the right-eye image (RO).

40. However, Lipton discloses the real time display field sequence and record output field sequence (fig. 24) which has 3 layers formed from the right even and left odd, right odd and left even, and right even and left odd, which exemplifies Lipton creating layers from different combinations of fields for the left and right eye.

41. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Nelson with Liptons' teaching of the real time display and record output field sequence to minimize record buffer size and leads to a more cost effective implementation (column 26 line 20-24).

42. Nelson (modified by Lipton) is silent in regards to a third sub-layer, however, Wu teaches multiple enhancement layers (fig. 4 and 5).

43. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Wus' teaching of multiple enhancement layers with Nelson (modified by Lipton and Oshima) for providing a coding scheme that where the difference between any two layers, even if small, can be used by the decoder to improve the image quality (column 5 line 33-42).

44. Regarding **claim 7**, Nelson (modified by Lipton and Oshima and Wu) as whole everything as claimed above, see claim 6. In addition, Nelson teaches the stereoscopic video encoding apparatus as recited in claim 6, wherein the main layer performs the estimation for motion compensation based on the information related to the main layer (fig. 12 element 410).

45. Regarding **claim 8**, Nelson (modified by Lipton, Oshima and Wu) as a whole teaches everything as claimed above, see claim 6. The stereoscopic video encoding apparatus as recited in claim 6, wherein the first sub-layer performs the estimation for motion compensation based on the information related to the first sub-layer, and performs the estimation for disparity compensation based on the information related to the main layer (Nelson teaches performing estimation for motion compensation based on the sub-layer (enhancement layer) and performing estimation for disparity compensation from information relating to the main (base) layer ([0134] and fig. 12).

46. Regarding **claim 9**, Nelson (modified by Lipton, Oshima and Wu) as a whole teaches everything as claimed above, see claim 6. In addition, Nelson teaches The stereoscopic video encoding apparatus as recited in claim 6, wherein the second sub-layer performs the estimation for motion compensation based on the information related

to the main layer and the second sub-layer (Nelson teaches where the enhancement layer performs estimation for motion compensation ([0134] and fig. 12). Nelson is silent in regards to a second sub-layer, however, Wu teaches multiple enhancement layers (fig. 4 and 5). The combination of Nelson, Lipton and Wu as a whole teaches performing estimation for motion compensation for a second sub-layer. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Wus' multiple enhancement layers with Nelson (modified by Lipton and Oshima) for providing a coding scheme that where the difference between any two layers, even if small, can be used by the decoder to improve the image quality (column 5 line 33-42).

47. Regarding **claim 10**, Nelson (modified by Lipton, Oshima, and Wu) as a whole teaches everything as claimed above, see claim 6. In addition, Nelson teaches the stereoscopic video encoding apparatus as recited in claim 6, wherein the third sub-layer performs the estimation for motion compensation based on the information related to the first sub-layer, and performs the estimation for disparity compensation based on the information related to the main layer and the second sub-layer. Nelson teaches performing estimation for motion compensation based on the sub-layer and the second sub-layer (enhancement layer) and performing estimation for disparity compensation from information relating to the main (base) layer ([0134] and fig. 12). Nelson discloses the enhancement encoding block 402 preferably also include4s an enhancement stream encoder 404 for receiving the right view video stream to perform motion based prediction and for encoding the right video stream to the enhancement stream using both the disparity based prediction and motion based prediction ([0134]). Although

Nelson is silent in regards to a second sub-layer, Lipton discloses where the record output field sequence contains more than one sub-layer (fig. 24).

48. Nelson (modified by Lipton) as a whole teaches the sub-layer performs estimation for disparity based on information relating to the main layer and a sub-layer, which reads upon the claimed limitation.

49. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Lipton with Nelson for providing a stereoscopic signal that can be processed to produce flickerless, field-sequential electronic stereoscopic display with good image quality (column 1 line 10-19).

50. Nelson (modified by Lipton) is silent in regards to a third sub-layer, however Wu teaches a multiple enhancement layers (fig. 4 and 5). The combination of Nelson, Lipton and Wu as a whole teaches a performing estimation for disparity compensation and motion compensation for information relating to the base layer from the third sub-layer.

51. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Wus' teaching of multiple enhancement layers with Nelson (modified by Lipton and Oshima) for providing a coding scheme that where the difference between any two layers, even if small, can be used by the decoder to improve the image quality (column 5 line 33-42).

52. Claims 15, 19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al., US-2002/0009137 and in view of Oshima et al., US-6,574,423.

53. Regarding **claim 15**, Nelson teaches A stereoscopic video decoding apparatus that supports multi-display modes based on a user display information, comprising: an inverse-multiplexing means for inverse-multiplexing supplied bit stream into multiple encoded streams corresponding to essential fields among encoded streams to be suitable for the user display information (fig. 12: 414), a decoding means for decoding the multiple encoded streams inverse-multiplexed in the inverse-multiplexing means by performing estimation for motion and disparity compensation (fig. 12:418, 420, 422); and a display means for displaying an image decoded in the decoding means based on the user display information ([0054] and fig. 1:46); and wherein the supplied bit stream includes a field of sub-layer of encoded streams that is based on the disparity estimation of a main layer of the encoded streams and motion estimation of an enhancement layer of the main layer (The base stream and the enhancement stream preferably are then multiplexed by a multiplexed by a multiplexer 412 at the transmission end and demultiplexed by a demultiplexer 414 at the receiver end. The demultiplexer base stream preferably is provided to a base stream decoder 422 to re-generate the left view video stream. The demultiplexed enhancement stream preferably is provided to an enhancement stream decoding block 416 to re-generate the right view disparity compensator 420 for disparity based compensation. The disparity compensator 420 preferably receives I-pictures and/or other references images from the base stream decoder 422 for decoding based on disparity between right and left views [0135] and fig. 12. Therefore, it is clear to the Examiner that Nelson discloses that both the left and right video streams are encoded with the motion compensated DCT

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encoder as well as input into the disparity estimator are received on the decoding side of the motion/disparity compensated coding and decoding system, which reads upon the claimed limitation.

54. Nelson is silent in regards to four encoded streams, wherein the bit stream is comprised of only the essential fields necessary to display the video on a display of a user.

55. However Oshima teaches where a right-eye signal 97 and a left-eye signal 98 are entered in a recording device 99. Being of interlace signals, in every 1/60, odd field signals 72a, 72b and even field signals 73a, 73b are entered. The signals are combined in combining units 101a, 101b, and transformed into frame signals 102a, 102b, in every 1/30 second. Compressed signals 83a, 83b compressed in compressing units 103a, 103b, column 12 line 35-42 and fig. 23. Since Oshima teaches the right and left eye signals are interleaved into even and odd fields and are compressed with compressing units, 103a, and 103b, it is clear to the examiner that Oshima teaches to generate encoded even and odd fields of the video signal for the right and left eye and respectively; wherein the bit stream is comprised of only the essential fields necessary to display the video on a display of a user (teaches where a right-eye signal 97 and a left-eye signal 98 are entered in a recording device 99. Being of interlace signals, in every 1/60, odd field signals 72a, 72b and even field signals 73a, 73b are entered. The signals are combined in combining units 101a, 101b, and transformed into frame signals 102a, 102b, in every 1/30 second. Compressed signals 83a, 83b compressed in compressing units 103a, 103b, column 12 line 35-42 and fig. 23. Since Oshima teaches

the right and left eye signals are interleaved into even and odd fields and are compressed with compressing units, 103a, and 103b, it is clear to the examiner that Oshima teaches to the bit stream is contains the right and left even and odd fields, which reads upon the claimed limitation).

56. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Oshima with Nelson providing a more cost effective signal processing of stereoscopic signals.

57. The Nelson decoding apparatus, now incorporating the encoded even and odd fields for the right and left eye, has all of the features of claim 15.

58. Regarding **claim 19**, Nelson (modified by Oshima) as a whole teaches everything as claimed above, see claim 15. In addition, Nelson teaches The stereoscopic video decoding apparatus as recited in claim 15, wherein the inverse-multiplexing means inverse-multiplexes the bit stream into the odd field of the left-eye image (LO), and even field of the left-eye image (LE), in case where the user display information indicates a two-dimensional display (2D) applications ([0030]), Further, Nelson discloses when the set-top box is used by the viewer is not equipped to decoded the enhancement stream he or she is still capable of watching the 3D stream in 2D on the display monitor [0051] and fig. 1. Therefore, it is clear to the examiner that only the field of one eye (left or right) would need to be demultiplexed, since the image or picture is flat or lacking depth).

59. Regarding **claim 22**, Nelson (modified by Oshima) as a whole teaches everything as claimed above, see claim 15. In addition, Nelson teaches The

stereoscopic video decoding apparatus as recited in claim 15, wherein the display means displays an image that is decoded from the odd field of the left-eye image (LO), and an image decoded from the even field of the left-eye image (LE) simultaneously, in case where the user display information indicates a two-dimensional display (The broadcast system as disclosed by Nelson supports production of two dimensional (2D) applications ([0030]), therefore it is clear to the examiner that only the field of one eye (left or right) would need to be decoded together in order to produce a flat image or an image that lacks depth).

60. Regarding **claim 24**, which recite a corresponding method of the decoding apparatus of claims 15-22. Thus the rejection and analysis made in claims 15-22 also apply here because the apparatus would have necessarily performed the method steps in claim 24.

61. Claims 16-18, 20-21, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al., US-2002/0009137 in view of Oshima et al., US-6,574,423 and further in view of Lipton et al.,US-5,416,510.

62. Regarding **claim 16**, Nelson (modified by Oshima) as a whole teaches everything as claimed above, see claim 15. In addition, Nelson teaches The stereoscopic video decoding apparatus as recited in claim 15, wherein the user display information includes a three-dimensional field shuttering display ([0060], [0098], fig.2: 112 and fig. 6), and a two-dimensional display (Nelson discloses the 3D broadcasting system may also support production of non-standard video streams for two dimensional

applications [0030]). Nelson is silent in regards to a three-dimensional frame shuttering display.

63. However, Lipton discloses the present invention is independent of the particular selection technique employed, and will work with any properly engineered individual shuttering device, column 12 line 4-23, which reads upon the claimed invention).

64. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Lipton with Nelson (modified by Oshima) for providing a stereoscopic signal that can be processed to produce flickerless, field-sequential electronic stereoscopic display with good image quality (column 1 line 10-19).

65. Regarding **claim 17**, Nelson (modified by Oshima) as a whole teaches everything as claimed above, see claim 15. Nelson is silent in regards The stereoscopic video decoding apparatus as recited in claim 15, wherein the inverse-multiplexing means inverse-multiplexes the bit stream into the odd field of the left-eye image (LO) and the even field of the right-eye image (RE), in case where the user display information indicates a three-dimensional field shuttering display.

66. However, Lipton teaches the inverse multiplexing means inverse-multiplexes the bit stream into the odd field of the left eye image (LO) and the even field of the right-eye image (RE), (column 15 line 43-52).

67. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Liptons with Nelson (modified by Oshima) for providing a stereoscopic signal that can be processed to produce

flickerless, field-sequential electronic stereoscopic display with good image quality (column 1 line 10-19).

68. Regarding **claim 18**, Nelson (modified by Oshima) as a whole teaches everything as claimed above, see claim 15. Nelson is silent in regards to The stereoscopic video decoding apparatus as recited in claim 15, wherein the inverse-multiplexing means inverse-multiplexes the bit stream into the odd field of the left-eye image (LO), even field of the left-eye image (LE), odd field of the right-eye image (RO), and the even field of the right-eye image (RE), in case where the user display mode reformation indicates a three-dimensional frame shuttering display. However, Lipton discloses demultiplexing the signal into a four-field sequence (left odd, right odd, left even, right even) column 10 line 7-21 and fig. 6A. Lipton further discloses where the display field sequence contains right even, left odd, right odd, left even...etc. fig. 24, and where the present invention is independent of the particular selection technique employed, and will work with any properly engineered individual shuttering device, column 12 line 4-23, which reads upon the claimed invention).

69. Nelson (modified by Oshima and Lipton) as a whole discloses the claimed invention except for the field order of the bit stream is LO, LE, RO, and RE. It would have been an obvious matter of design choice to order field sequence of the image being generated to LO, LE, RO, and RE since applicant has not disclosed that the sequence of LO, LE, RO, and RE solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with displaying the pictures from images decoded the RE, LO, RO, and LE sequence.

70. Regarding **claim 20**, Nelson (modified by Oshima) as a whole teaches everything as claimed above, see claim 15. Nelson is silent in regards to The stereoscopic video decoding apparatus as recited in claim 15, wherein the display means displays an image that is decoded from the odd field of the left-eye image (LO), and an image that is decoded from the even field of the right-eye image (RE) at predetermined time intervals, in case where the user display information indicates a three- dimensional field shuttering display.

71. However, Lipton discloses the relative timing sequence of the record output field sequence which contains an even sequence generated from a right even and left odd (fig. 24). Lipton further teaches the images are displayed at 1/120 sec per from (fig. 6A). Lipton discloses where the present invention will work with any properly engineered individual shutter selection device (column 12 line 4-23).

72. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Lipton with Nelson (modified by Oshima) for providing a stereoscopic signal that can be processed to produce flickerless, field-sequential electronic stereoscopic display with good image quality (column 1 line 10-19).

73. Regarding **claim 21**, Nelson (modified by Oshima) as a whole teaches everything as claimed above, see claim 15. Nelson is silent in regards to The stereoscopic video decoding apparatus as recited in claim 15, wherein the display means displays an image that is decoded from the odd field of the left-eye image (LO), an image decoded from the even field of the left-eye image(LE), an image decoded

from the odd field of the right-eye image (RO), and an image decoded from the even field of the right-eye image (RE) at predetermined time intervals, in case where the user display mode information indicates a three-dimensional frame shuttering display.

74. However, Lipton discloses the output field sequence is generated from RE, LO, RO, and LE fields (fig. 24). Lipton also discloses wherein the four field display is in field sequential format and has a display of 1/120s (fig. 6A). Lipton discloses the present invention is independent of the particular selection technique employed, and will work with any properly engineered individual shuttering device, column 12 line 4-23, which reads upon the claimed invention).

75. The combination of Nelson (modified by Oshima and Lipton) as a whole have the majority of the features of claim 21, but still fails to disclose the display means displays an image decoded from the odd field of the left eye, an image decoded from the even field of the left eye, and image decoded from the odd field of the right eye, and an image decoded from even field of the right eye.

76. It would have been an obvious matter of design choice to order the image being generated in the sequence of LO, LE, RO, and RE since applicant has not disclosed that the sequence of LO, LE, RO, and RE solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with displaying the pictures from images decoded RE, LO, RO, and RE.

77. Regarding **claim 26**, the analysis made in claims 15-22 also apply here. Nelson (modified by Oshima and Lipton) as a whole teach a microprocessor based system.

Hence a microprocessor for executing the necessary steps corresponding to the apparatus of claims 15-22 would be inherent.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA ROBERTS whose telephone number is (571)270-1821. The examiner can normally be reached on 7:30-5:00 EST Monday-Friday, Alt Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Jessica Roberts/
Examiner, Art Unit 2621
/Tung Vo/
Primary Examiner, Art Unit 2621

